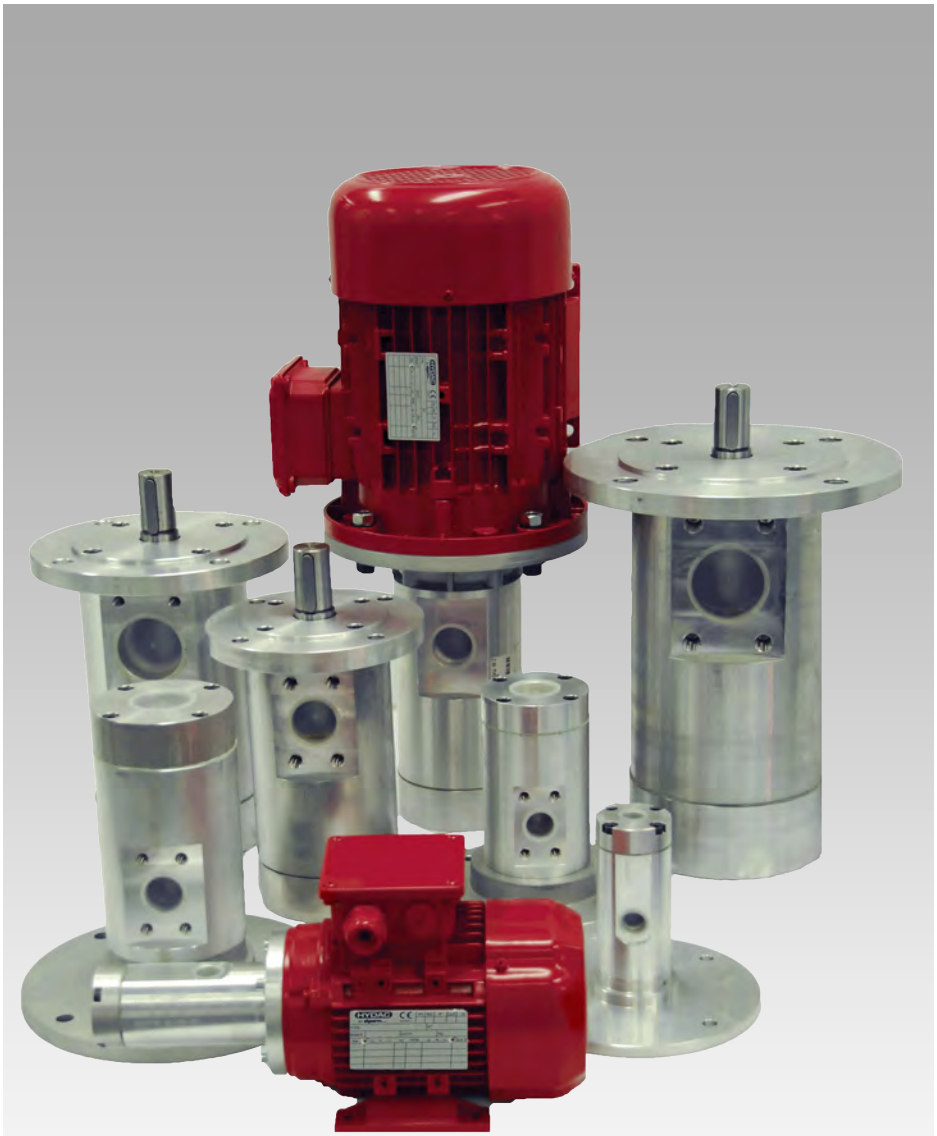
HYDAC INTERNATIONAL

Hydraulic Screw Pumps

HSP



DESCRIPTION

GENERAL

These pumps are suitable for industrial applications where high reliability and low noise are required.

They produce very low vibration, pulsation and guarantee a long life for your applications.

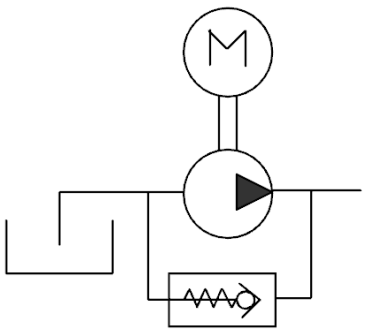
They are optionally coupled with reliable electrical motors and can be used in many kinds of hydraulic applications.

The pumps can be equipped with an integrated pressure by-pass as an option.

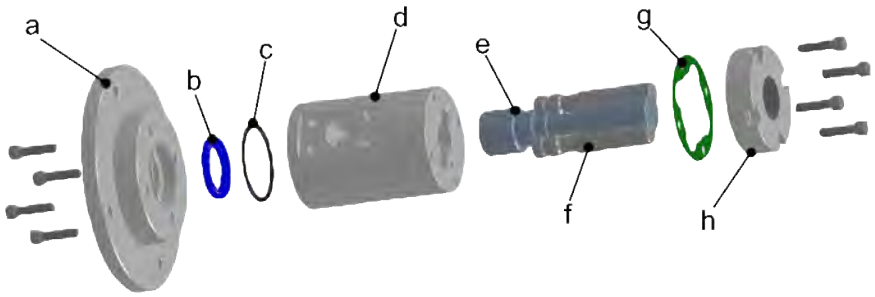
APPLICATION

Hydraulic/Lube

- Cooling
- Fluid transferring
- Lubrication



CONSTRUCTION



(a) Mounting flange
(b) Seal
(c) O-ring seal
(d) Body
(e) Main Screw
(f) Satellite Screw
(g) Gasket
(h) Suction Cover

The HSP are volumetric pumps transferring the pressure axially. Internally there are three moving parts: the main screw is the only driven part and it transmits the movement to the two satellite screws.

PUMP SPECIFICATIONS
TECHNICAL SPECIFICATIONS

Types	**HSP (E)** - External, **HSP (S)** - Submersible
Outlet pressure (without bypass)	40 bar continuous - 50 bar intermittent
Inlet pressure	Min. – 0.7/ Max. 3 bar
Viscosity	From 4 up to 2,000 mm²/s
Ambient temperature	From -20º up to +60ºC
Hydraulic temperature	From -20º up to +180ºC
Flanges	ISO 3019/2 IEC Standard (for directed coupling with motor)
Connections	SAE 3000 / BSP ISO 228
Installation position	Free for HSP “E” / submerged (totally or partially) for HSP “S”
Drive loading	No axial or radial loads
Shaft rotation	Clockwise viewed at the shaft end
Groups	20 - 25 - 32 - 40 - 45 - 55 - 60 - 70 - 80 - 90 - 110
Flows	From 8 up to 3,200 Lt/min (at 2,850 rpm)
Fluids	Mineral oil HLP, HVLP Ecologic fluids HETG,HEPG,HEE Synthetic fluid HFDR phosphate ester Lubrication high viscosity oils (*) Special synthetic fluid: MIL-H, SKYDROL (special on request)
Seals	NBR, VITON, FPM, EPDM
Noise	From 52 up to 68 dB(A) at 2,850 rpm
Pump body (standard)	Extruded aluminium alloy
Pump body (optional)	Cast iron, stainless steel
Screw	Steel for primary screw, cast iron for secondary screw
Filtration	Permissible degree of fluid contamination NAS 1638, class 10 or ISO 4406 – 21/19/16 Recommended filtration µm 25 at β 75
Maintenance	No maintenance required

* *: For high viscosity applications and/or oil-air emulsions, please check with us the suitable pump model.*
The data shown in the brochure can change without notice. For special applications - please contact HYDAC Pty Ltd.

MODEL CODE

HSP

HSP20 - E - 3 - HL - B5 - SD - V - B10 - AX - BB

Size
HSP20 = Group size
HSP20, HSP25, HSP32, HSP40,
HSP45, HSP55, HSP60, HSP70.

Type
E = External
S = Submersible

Displacement
cc/rev = 3 - 291 (larger displacements available)
Flow is dependant on may factors. i.e. viscosity, pressure etc.

Viscosity range
HL = Hydraulic/Lube

Direct drive / Mounting flange
B5 = Direct drive pump
B14 = Direct drive pump (Only applicable to HSP20)
ISO = Mounting flange for bell housing units

Shaft diameter / Key size
SD14/5 = 14 mm shaft/ 5 mm key size
SD19/6.5 = 19 mm shaft/ 6.5 mm key size
SD24/8.5 = 24 mm shaft/ 8.5 mm key size
SD28/8.5 = 28 mm shaft/ 8.5 mm key size
SD32/10 = 32 mm shaft/ 10 mm key size

Shaft seal
V = Viton
B = Buna
E = EPDM
F = FPM

Internal bypass
BX = Blocked
B5 = 5 bar
B10 = 10 bar
B15 = 15 bar

Suction port configuration
AX = Axial
PD = Perpendicular

Port type and size
1st letter = Suction port size (B=1/2" suction port size)
2nd letter = Discharge port size (B=1/2" discharge port size)

Based on VG46. *For higher viscosity contact us.*
NPSH - Expressed in BAR (Gauge pressure)

ISO 228 (BSPP)	
Type	**Port size**
B	1/2"
C	3/4"
D	1"
E	1 1/4"
F	1 1/2"
G	2"
M	3"

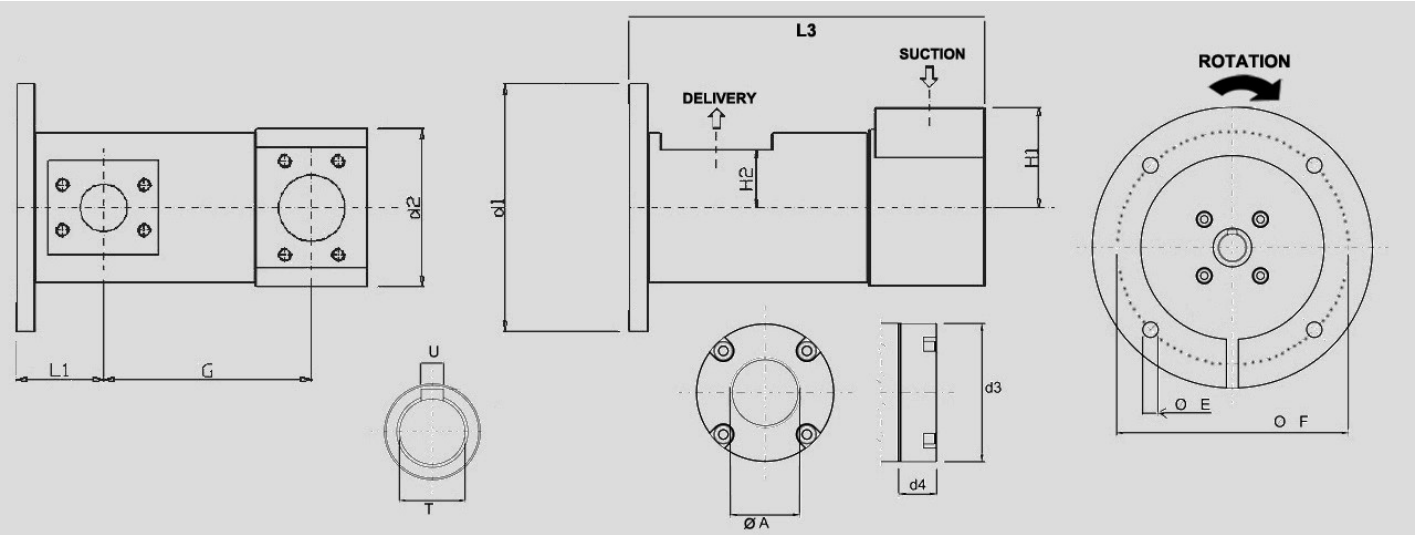
SAE 3000 (Code 61)		
Type	**Port size**	**DN Size**
I	1"	20
J	1 1/4"	32
K	1 1/2"	40
L	2"	50
M	2 1/2"	65
N	3"	80
O	3 1/2"	90
P	4"	100

Net Positive Suction Head		
Group	**Recom.**	**Min.**
HSP20	0.2	0.1
HSP25	0.2	0.1
HSP32	0.2	0.1
HSP40	0.2	0.1
HSP45	0.2	0.1
HSP55	0.2	0.1
HSP60	0.2	0.1
HSP70	0.2	0.1

Displacement	
Group	**cc/rev**
HSP20	3,4,5,7
HSP25	9
HSP32	13,20,27
HSP40	36,45,55
HSP45	65,76,91
HSP55	110,138
HSP60	160, 182
HSP70	291

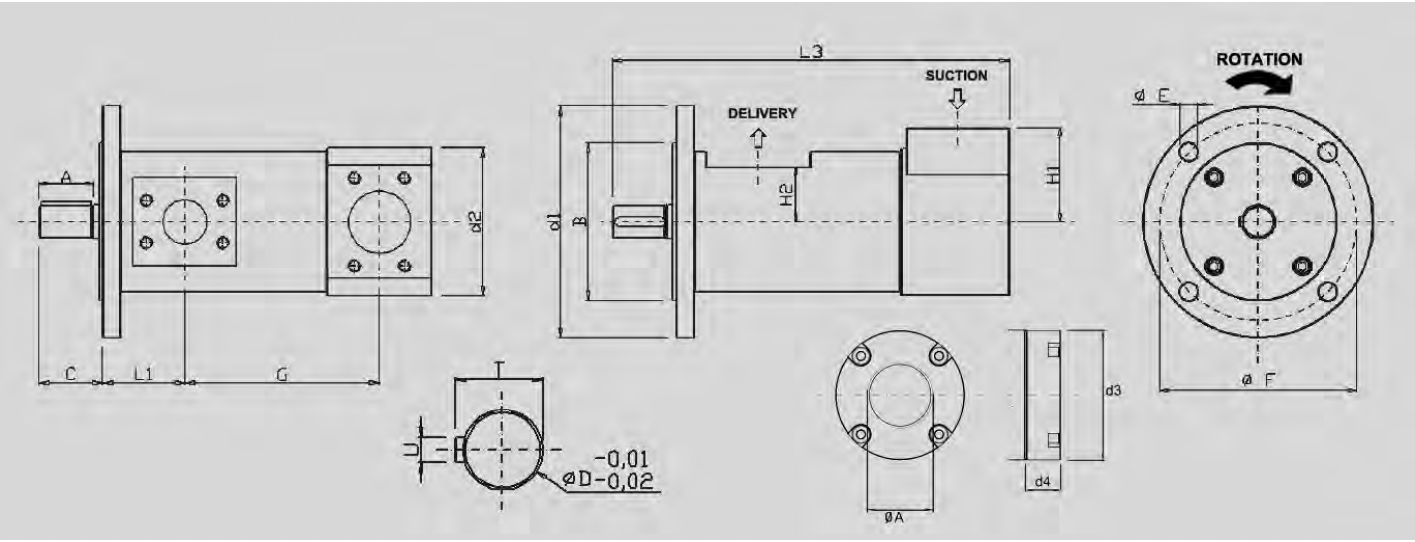
Note: Please refer to dimensions table (Page 4) for available port sizes. Not all combinations are possible.

DIMENSIONS
HOLLOW SHAFT (DIRECT DRIVE)



	Flange			Shaft		Suction		Discharge		Pump							
Type	*E*	*F*	*d1*	*T*	*U*	*ØA Std*	*ØA Opt*	*ØM*	*H2*	*d2*	*d3*	*d4*	*L3 Std*	*L3 Opt*	*L1*	*G*	*kg*
HSP20 - B14	6.5	85	104	14.3	5	1/2" BSPP-Axial	1/2" BSPP-Radial	1/2" BSPP	25	59	59	21	140	160	53	78	1.5
HSP20 - B5	11	165	200	19.3 16.2	6.5	1/2" BSPP-Axial	1/2" BSPP-Radial	1/2" BSPP	25	59	59	21	155	175	53	78	1.5
HSP25	10.5	165	200	19.3	6.5	3/4" (Axial)	3/4" BSPP-Radial	1/2" BSPP	27.5	65	65	40.5	182	182	64	87	2.5
HSP32	12	165	200	24	8.5	1 ½" BSPP	1 ¼" SAE	1" SAE	41	95.5	94	26	195	242	84.7	123	5
HSP40	14	215	251	28	8.5	1 ½" BSPP	1 ½" SAE	1 ¼" SAE	46.5	112	108	35	247	304	104.5	149.5	7

STANDARD SHAFT (BELL HOUSING)



	Flange				Shaft				Suction		Discharge		Pump								
Type	*B*	*E*	*F*	*d1*	*A*	*D*	*T*	*U*	*ØA Stnd*	*ØA Opt*	*ØM*	*H2*	*C*	*d2*	*d3*	*d4*	*L3 Std*	*L3 Opt*	*L1*	*G*	*kg*
HSP45	125	14	160	188	55	32	35	10	3" BSPP	2" SAE	1 ½" SAE	51,5	64.5	126.5	122.5	50	331	375	75.4	189.7	11
HSP55	160	18	200	235	55	32	35	10	3" BSPP	2 ½" SAE	2" SAE	55	64.5	148.5	142.5	46	338.5	402.5	83.5	203	15.5
HSP60	160	18	200	235	55	32	35	10	3" BSPP	3" SAE	2 ½" SAE	63	65.5	160	155	49	358	440	83.5	228	25
HSP70	200	22	250	300	55	32	35	10	3 ½" SAE	3 ½" SAE	3" SAE	73	65.5	180	180	71	432	507	94.5	278.5	30

MOTOR SELECTION

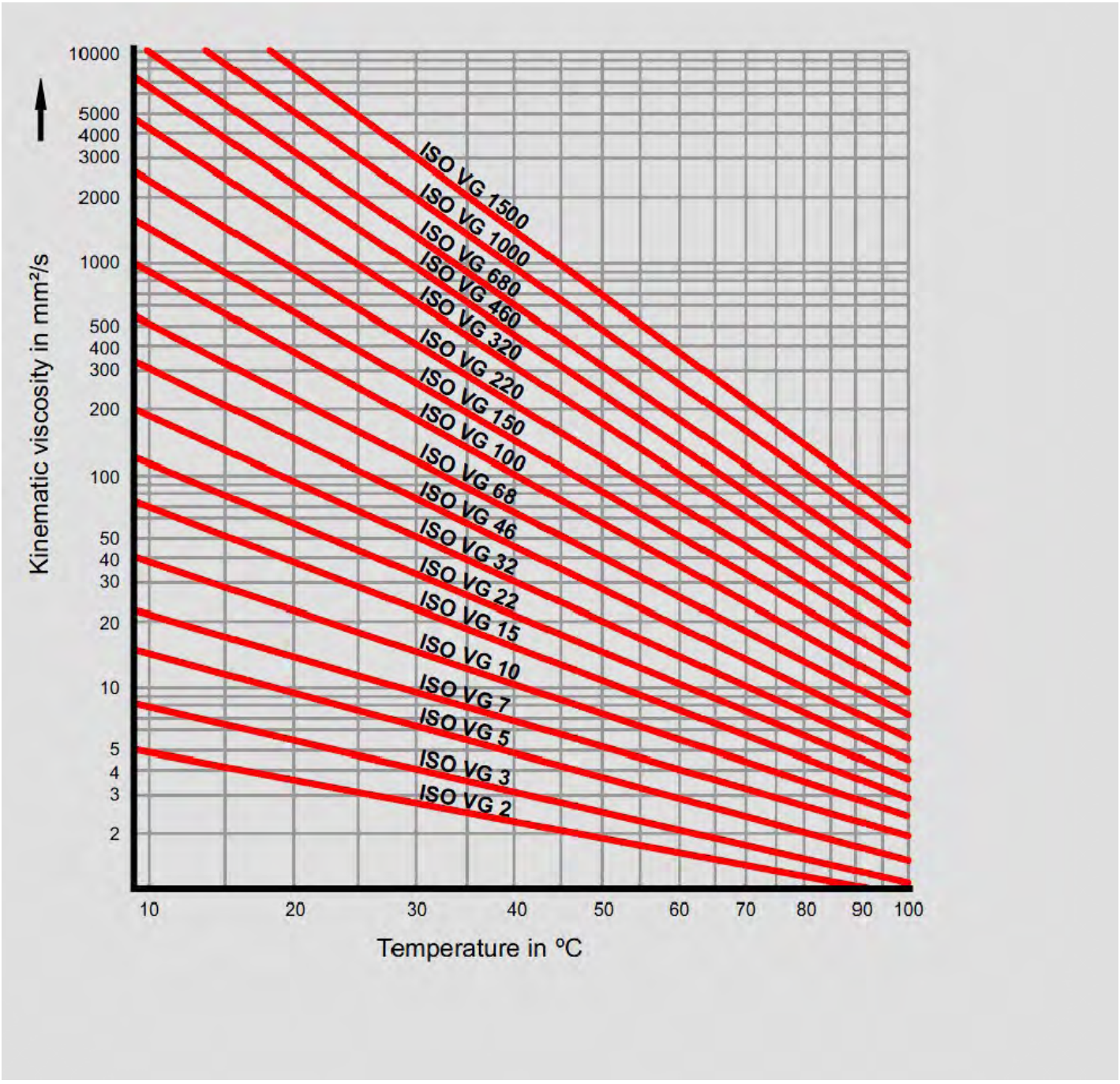
HOLLOW SHAFT (DIRECT DRIVE)

	Motor	71 SD14	80 SD19	90 SD24	100 SD28	112 SD28	132 SD28
HSP20	B14						
	B5						
HSP25	B5						
HSP32	B5						
HSP40	B5						
HSP45	B5						
HSP55	B5						
HSP60	B5						
HSP70	B5						

Stock Items

Available on request

VISCOSITY / TEMPERATURE GRAPH



WARNINGS AND RECOMMENDATIONS

HOLLOW SHAFT

Remove plastic plugs from outlet and inlet ports.
To facilitate venting, ensure the suction port is always at the top.

Proceed as follows:

- Check the motor: Verify the perpendicular aspect of the flange to the motor shaft: 0.05mm max allowed.
- The use of IP65 motor is suggested.
- Warranty is void if motor is outside the recommended tolerance.
- Put the motor in a **vertical position**, as per diagram.
- The pump has to **enter freely** over the shaft of the electric motor.
- **Do not use excessive force**. If necessary remove and polish the key shaft of the electric motor.
- After you have tightened the four mounting screws, check that the pump-motor group **turns freely by rotating the motor fan**. If it does not turn, the shafts may be misaligned.
- Recheck tolerances.

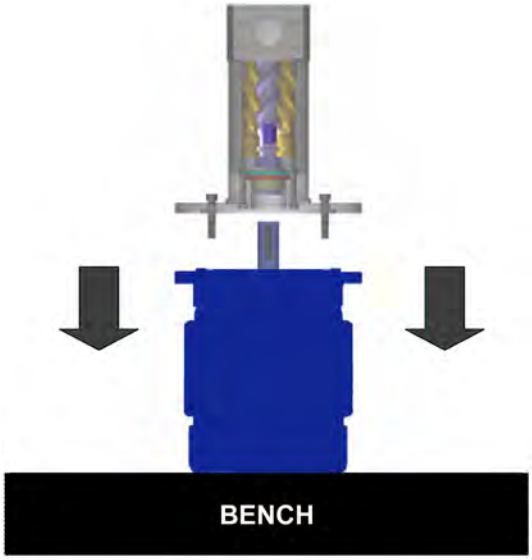


Fig 1. Hollow Shaft Mounting

COUPLINGS

Flexible couplings are intended to provide a mechanically flexible connection for two aligned shaft-ends. Flexible couplings are not intended to compensate for major angular or parallel shaft misalignment. The allowable misalignment varies with the type of coupling. Any improvement in alignment beyond coupling manufacturer's minimum specification will extend pump, mechanical seal or packing, coupling, and driver service life by reducing bearing loads and wear.

BELTS AND SHEAVES

It is only acceptable to belt drive HYDAC SCREW PUMPS that are specifically designed for this purpose. It is generally not acceptable to belt drive pumps with ratings in excess of 40 bar (580 psi) differential pressure.
Contact HYDAC PTY LTD if not sure whether a particular pump can be belt driven.

Belts and sheaves must be properly selected, aligned and tensioned to minimize belt wear, eliminate possibility of belt turnover in sheave grooves, and avoid excessive side load on pump shaft. Adjustable slide rails mounted under driver are recommended for proper belt tensioning.

Check belt tension frequently during first 24 to 48 hours of run-in operation. Follow belt drive manufacturer's recommendations for alignment of sheaves and belt-tension settings.

CAUTION:

- **Flexible couplings are NOT intended to permit significant shaft misalignment. Proper alignment must be established/maintained to obtain proper operation and maximum life.**
- **Shaft alignment - must be aligned within 0.1mm (0.005 inch) FIM (Full Indicator Movement) for face (angularity) and rim (parallelism) at or near coupling outer diameter while rotating both shafts together one full turn (360°).**
- **Be sure all coupling set-screws and bolts are tight and coupling gap is properly set.**
- **Loose, slipping belts will squeal and cause overheating of sheaves leading to reduced belt life. Excessively tightened belts will result in reduced belt and bearing life and possible bearing or shaft failure.**
- **To reduce possible FRETTING corrosions, please use appropriate grease to lubricate the motor shaft.**
- **For hollow shaft pumps, only motors with an entrapped key are permitted. Motor shafts with a floating key may allow the key to dislodge and damage pump shaft. Key must be secured with roll pin to motor shaft in most cases.**

NOTES:

· **FRETTING:** To reduce the corrosion due to fretting, we recommend greasing the motor shaft with dedicated products (e.g.: lubricants based on MoS2, Loctite ® 8008, Molykote ® G-n plus, Turmopast ® MA2).
· **FRETTING:** To reduce the corrosion due to fretting, we recommend checking the electric motor's ground connection and also checking that the shaft residual currents are within the norms.
· **LEACKAGE PREVENTION:** In case of wear of shaft seal to avoid leakage, all pump flanges with hollow shaft have a threaded ¼" GAS thread that can be used for drainage connection to the tank.

NOTES

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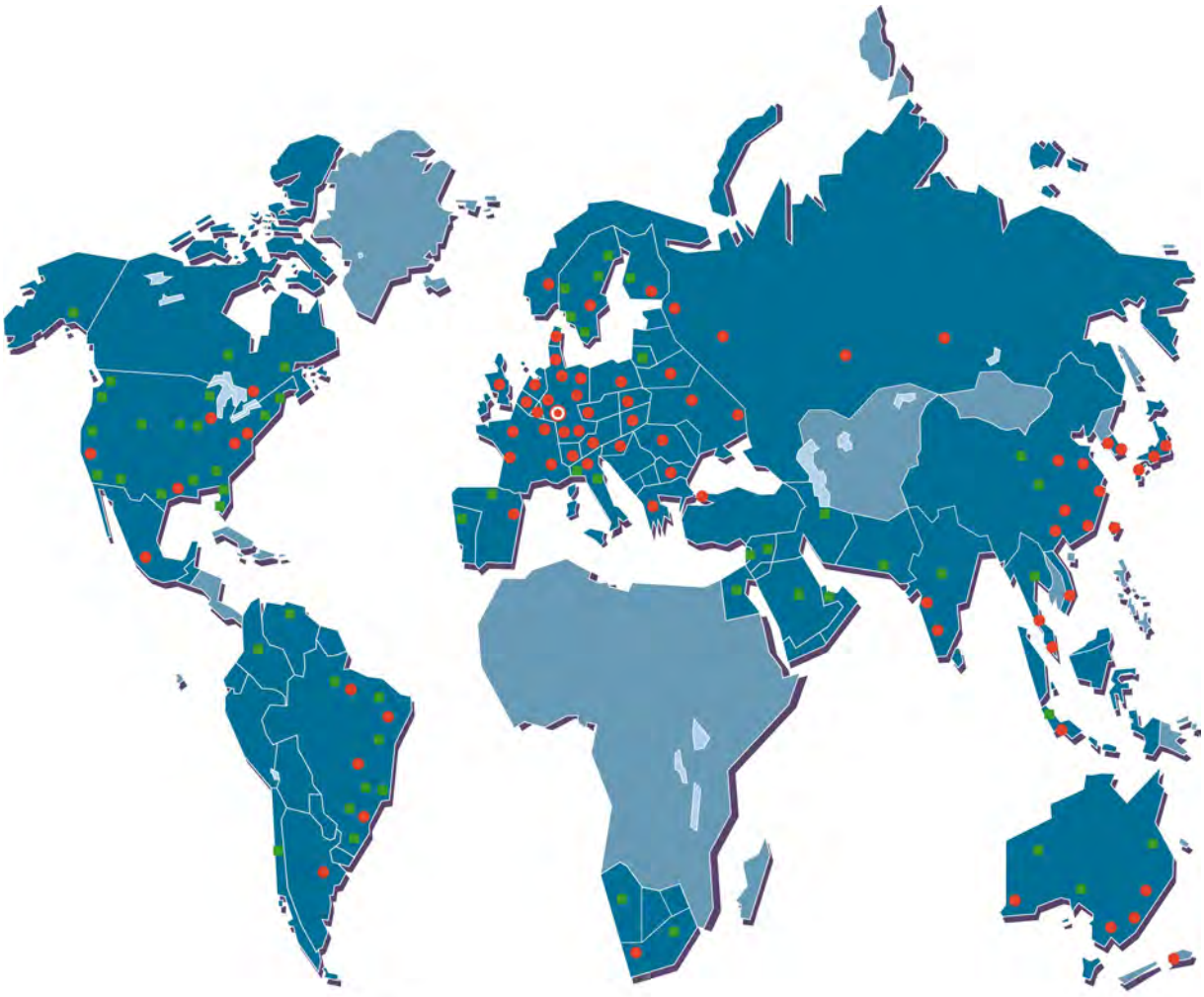

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